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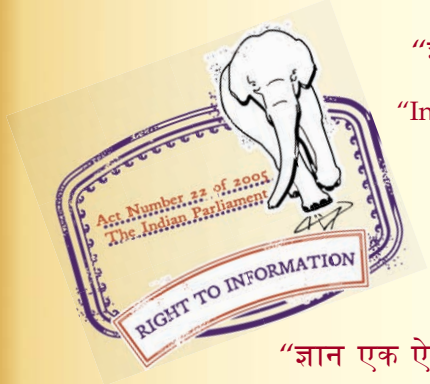
IS 10312 (1982): Safety code for powered tow trucks [TED 22: Transport Tractors and Trailers]



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IS : 10312 - 1982

Indian Standard

(Reaffirmed 2001)

SAFETY CODE FOR POWERED TOW TRUCKS

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Indian Standard

SAFETY CODE FOR POWERED TOW TRUCKS

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SAFETY CODE FOR POWERED TOW TRUCKS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 29 September 1982, after the draft finalized by the Industrial Trucks Sectional Committee had been approved by the Marine, Cargo Movement and Packaging Division Council.

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1. SCOPE

1.1 This standard specifies the safety requirements for the manufacture, operation and maintenance of tow trucks.

2. TERMINOLOGY

2.1 Tow Trucks — A powered truck, with solid or pneumatic tyres, with three or more wheels with front or rear drive wheels, intended for towing or shunting one or several non-powered trucks or trailers, inside or outside building and under exceptional circumstances on public roads.

3. NOMINAL RATING

3.1 The nominal rating of two trucks shall be expressed by the maximum drawbar pull, in decanewtons, that can be developed at a specified coupling height while moving a load at a uniform speed not less than 1 percent of the maximum no load speed.

3.2 The drawbar pull shall be measured when the tow truck is travelling on a smooth, dry, horizontal, concrete surface, at the uniform test speed obtained after acceleration, with a horizontal towbar in the longitudinal axis of the vehicle, and with a driver weighing about 70 kg in the case of a sit on or stand-on tow truck.

4. STEERING CONTROL

4.1 All steering controls shall be confined within the plan view outline of the tow truck, or guarded to prevent injury to the operator during movement of the controls when passing obstacles, walls, columns, etc.

4.2 Where steering must be accomplished with one hand, steering knobs are necessary for safe operation. Steering knobs, when used, shall be mounted within the periphery of the steering handwheel and provision shall be made to prevent injury to the operator's hand.

4.3 When conditions of use would result in steering shocks being generated, the transmission of such shocks to the steering handwheel shall be limited to the extent necessary to avoid injury to the driver's hand or arm.

4.4 Where a steering handwheel and knob are used, either the configuration shall be of a design which shall minimize the hazard from a spinning handwheel due to road reaction feedback, or the steering mechanism shall be of a type which prevents road reactions from causing the steering handwheel to spin.

4.5 On all tow trucks on which the operator faces in the nominal line of travel and which are steered by means of a steering wheel (horizontal, inclined or vertical), a clockwise rotation of the steering wheel shall steer the tow truck to the right in the forward direction of travel.

4.6 Steering Handle

4.6.1 The handle on the tongue shall be provided with suitable means to protect the operator's and against injury from swinging doors, walls, columns, etc.

4.6.2 Hand/rider tow trucks employing a steering tongue control which extends beyond the confines of the tow truck shall steer with the walking riding operator facing in the direction of travel, with the load trailing, clockwise movement of the steering tongue shall steer the truck clockwise.

5. TYRES

5.1 For smooth, dry floor operation, smooth tread solid tyres may be used.

5.2 If floor conditions are wet and smooth, then tyres with nonskid tread shall be used.

5.3 Where floors are rough, pneumatic tyres shall be used.

6. SAFETY CONTROL AND BRAKES ELECTRIC POWERED SIT-DOWN RIDER TOW TRUCKS

6.1 Means shall be provided to open automatically the travel circuit when the operator leaves the tow truck.

6.2 Travel control shall be so arranged that the tow truck shall move only when the direction control is actuated and shall not move at a speed greater than inching speed unless control has been actuated for both speed and direction. Where no neutral position is provided, the tow trucks shall not move unless the speed control is activated.

6.3 The accelerator, if foot operated, shall be located for operation by the right foot and shall increase travel speed when depressed.

6.4 Service brakes, if foot operated, shall be applied by depressing the pedal.

6.5 When a single pedal is used to control both the above functions (that is acceleration and braking), it shall be located for operation by the right foot and shall release the brakes and increase travel speed when depressed. Conversely it shall reduce travel speed and apply the brakes when released.

7. SAFETY CONTROL AND BRAKES-INTERNAL COMBUSTION ENGINE POWERED SIT-DOWN RIDER TOW TRUCKS

7 1 Travel control shall be so arranged that the tow truck shall move only when the direction control is actuated and shall not move at a speed greater than inching speed unless control has been actuated for both speed and direction.

7.2 Service brakes, if foot operated, shall be energized by depressing the pedal.

7.3 If a combination clutch-and-brake pedal is used, the initial pedal movement shall disengage the clutch and the final pedal movement shall apply the brakes, and the pedal shall be operated by the left foot.

7.4 The accelerator, if foot operated, shall increase speed when depressed.

7.5 If a combination pedal controls both acceleration and brakes, depressing the accelerator portion shall increase speed and depressing the brake portion shall apply the brakes, and the combination pedal shall be operated by the right foot.

7.6 The clutch pedal, if used, shall disengage the clutch when depressed with the left foot.

8. SAFETY CONTROL AND BRAKES-ELECTRIC POWERED STAND ON TOW TRUCKS

8.1 Means shall be provided to open automatically the travel circuit when the operator leaves the truck.

8.2 Means shall be provided so that the travel circuit can be activated only by releasing the parking brake and resetting the speed and/or directional control(s) when the operator assumes the driving position.

9. SAFETY CONTROL AND BRAKES-INTERNAL COMBUSTION ENGINE POWERED STAND-ON TOW TRUCKS

9.1 The accelerator, if foot operated, shall increase the speed when depressed with the right foot.

9.2 Travel control shall be so arranged that the tractor will not move until the direction control has been actuated and will not move at a speed greater than inching speed unless control has been actuated for both speed and direction.

10. POWER SYSTEMS AND ACCESSORIES

10.1 Internal combustion engine driven tow trucks [diesel, petrol and liquefied petroleum gas (LPG)].

10.1.1 *Exhaust and Cooling Systems*

10.1.1.1 The exhaust system shall be arranged with due consideration for the comfort and well-being of the operator and other personnel. The air flow through the cooling system shall also be arranged in a manner to avoid discomfort to the operator.

10.1.2 *Fuel Tank*

10.1.2.1 A fuel tank shall not be located directly over the engine. If a tank is within or contiguous to the engine compartment, the tank and/or fill arrangement shall be isolated from the electrical and exhaust systems by a separate enclosures or by baffles.

10.1.2.2 The tank location and the facilities for filling shall be such that spillage or leakage will drain to the ground and not on to the engine or on to electrical or exhaust-system parts, or into the operator's compartment. Fuel spillage shall not be possible under operating conditions.

10.1.2.3 A fuel tank and its fitting shall be so located as to minimize the possibility of damage to the tank or its fittings.

10.1.3 *Containers*

10.1.3.1 The container(s) for LPG may be either permanently fixed on the truck or quickly removable.

10.1.3.2 Containers shall be fitted on the tow trucks in such a manner as to be protected against atomopheric corrosion and from corrosive action of the products handled by the truck.

10.1.3.3 The containers shall be firmly secured to the tow truck, and the fastening shall be unaffected by vibration.

10.1.3.4 Containers, whether fixed or removable, shall be equipped with a device to prevent the sudden emission of a large volume of gas, particularly in the case of a pipe failure. The fuel take-off on the container shall be equipped with an easily accessible, manually operated valve. The fuel shall be taken off in liquid form unless the container and the engine are specially equipped for direct vapour withdrawal.

10.1.3.5 A suitable safety pressure-relief valve shall be connected to the vapour space of the container. Where such containers are fitted inside compartments of vehicles, the discharge side of the relief valve shall be piped to atmosphere.

10.1.3.6 Where containers are fitted inside compartments of vehicles, the discharge side of any maximum level indicating device which relies on bleeding gas to atmosphere shall terminate at a readily visible position on the outside of the vehicle.

10.1.3.7 If containers are installed in a compartment, this compartment shall have permanent openings at the top and bottom allowing adequate ventilation to outside atmosphere.

10.1.3.8 When containers are removable, their fastening shall permit easy handling and easy checking of installation after the exchange of containers.

10.1.4 *Piping*

10.1.4.1 Connecting piping and all associated parts shall be easily accessible, protected against damage and wear, and flexible enough to withstand vibration and deformation in service. Pipework shall be so arranged that damage or leaks are easily detectable and shall be installed in such a way that it cannot be damaged by the hot parts of the engine. Fully rigid pipes for connecting the container to equipment on the engine shall not be used.

10.1.4.2 Hoses and all connections shall be replaced at the first indication of damage or deterioration.

10.1.4.3 The container and its connections shall be installed in such a way that there are no projections outside the overall contour of the truck. Container connections shall be protected by a rigid guard.

10.1.4.4 Any section of pipework containing LPG between two shut-off valves, which may be closed, shall be protected against excessive pressure by means of a suitable pressure-relief valve.

10.2 Electric Tow Truck

10.2.1 *Battery*

10.2.1.1 An air space of at least 30 mm shall be provided above the live terminals of the battery, or the cover shall be provided with an insulated lining.

10.2.1.2 Ventilation openings shall be provided in the battery container or compartment above the cells.

10.2.1.3 If there are openings in the cover, they shall be protected against the entrance of foreign bodies. The cover shall be rigid enough to obviate, in normal use, any distortion which might bring it into contact with live parts of the cells.

10.2.1.4 Batteries and containers shall be retained in the tow truck in such a manner as to prevent displacement during normal use.

11. OPERATION

11.1 Capacity Modifications and Markings

11.1.1 The manufacturer's rated capacity of the tow truck shall be exceeded.

11.1.2 Any design modifications and additions liable to influence capacity and operating safety shall be effected only after the approval of the manufacturer.

11.1.3 Modifications arising from application of ancillary attachment shall be performed in such a manner that safety is not reduced and in accordance with the provisions of this safety code. Capacity, operation, and instruction plate, shall be changed accordingly.

11.1.4 The user shall ensure that all name-plates and markings are in place and are maintained in a legible condition.

11.2 Fuel Handling and Storage

11.2.1 Trucks shall be refuelled only at locations designed for that purpose. The locations shall be ventilated to minimize the accumulation of flammable fumes. LPG containers shall not be filled, and removable LPG containers shall not be exchanged near open pits, underground entrances, elevator shafts or other similar areas.

11.2.2 Smoking shall be prohibited in refuelling areas; which shall be indicated by signs.

11.2.3 Liquid fuel, not dispensed from approved pumps, shall be handled in closed containers.

11.2.4 LPG containers shall be stored and transported with the service valve closed and the safety valve in direct communication with the vapour space of the container. The protective caps provided shall be fitted on the connections when containers are stored.

11.2.5 LPG containers shall be inspected to ensure that no vapour leakage exists before recharging and/or reusing. Particular attention shall be given to the valves and connections. Damaged containers shall not be used. Repairs may be made only by authorized firms and tested and certified by competent authority.

11.3 Battery Charging and Changing

11.3.1 Battery charging installations shall be located in areas designated for that purpose. Facilities shall be provided for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by tow truck, and for adequate ventilation for dispersal of fumes from gassing batteries.

11.3.2 Smoking shall be prohibited in charging areas; this shall be indicated by signs.

11.3.3 Only trained and authorized personnel shall charge or change batteries. Persons maintaining batteries shall wear protective clothing.

11.3.4 All battery changing shall be carried out in accordance with manufacturers instructions. When reinstalling batteries, means shall be provided for correctly connecting, positioning and securing batteries. Tools and other metallic objects shall be kept away from the top of uncovered batteries.

11.3.5 The battery of an electric tow truck shall not be replaced by another battery having different voltage, weight or size, without specific authorization (by the original manufacturer of the tow truck, if possible).

11.3.6 Only batteries meeting the tow truck manufacturer's specifications shall be used. Means shall be provided for the safe changing of batteries.

12. MAINTENANCE

12.1 Preventive maintenance, lubrication and inspection of all powered tow trucks shall be performed according to a scheduled system in

conformity with the following items and, in particular, with the manufacturer's recommendations, which should accompany the tow trucks when delivered.

12.2 Only qualified and authorized personnel shall be permitted to maintain, repair, adjust and inspect tow trucks.

12.3 Brakes, steering mechanisms, control mechanisms, warning devices, lights, governors, shall be maintained in a safe operating condition.

12.4 Batteries, motors, controllers and contractors, limit switches, protective devices, electrical conductors and connections shall be inspected and maintained in accordance with generally accepted good practice. Special attention shall be paid to the condition of electrical insulation.

12.5 Exhaust system and adjustments of carburettor evaporator and fuel pump of internal combustion engine powered tow truck shall be checked with regard to damage and leakage.

NOTE — During maintenance, the operation of internal combustion engines in confined areas can produce noxious substances. Adequate ventilation is recommended when internal combustion engines are operated in such confined areas.

12.6 Pneumatic types shall be checked for wear and tear of bearing surfaces, side walls and rims. The inflation pressure specified by the tow truck manufacturers shall be maintained. Before demounting pneumatic tyres on split rims, precautions shall be taken to ensure that the internal pressure has been completely relived.

12.7 All information and instruction plates shall be maintained in a legible condition.